

Tuberculosis Information – Dr. Russ Dalv, SDSU Extension Veterinarian, Feb. 11, 2007

On Thursday, February 8, the South Dakota Animal Industry Board reported that bovine tuberculosis had been confirmed in a cow that was traced back to a southeast South Dakota feedlot.

Here is some information regarding tuberculosis in general. Specific information regarding the traceback-traceforward and testing procedures will come from the SD Animal Industry Board. This is a timely example of the importance of an effective means of individual animal identification and tracing.

South Dakota has been bovine tuberculosis-free since 1982. The state's tuberculosis-free status is currently unchanged; however, this status could be affected if other infected herds are identified within the state. Minnesota officially lost its TB-free status in January, 2006, after five infected herds had been identified. As of this date, a total of seven herds have been identified as TB-infected in Minnesota.

Bovine tuberculosis is a chronic and slowly progressive disease of cattle, with an incubation time (time from exposure to onset of clinical signs) ranging from months to years. Most often, infected cattle will show little to no outward signs of infection. When clinical signs are present, they will often be vague symptoms, such as weight loss, depression, and sluggishness.

Tuberculosis infection primarily involves the lungs; therefore, cattle with advanced stages of the disease may show difficulty in breathing, cough, or a nasal discharge. These signs, of course, are not specific to tuberculosis infection. Respiratory ailments due to a number of causes are not uncommon in cattle, and will cause affected animals to show the same type of clinical signs.

There is no effective treatment for bovine tuberculosis.

Because infected cattle will infrequently show signs of illness, cases of tuberculosis are often diagnosed on the basis of lesions found on slaughter inspection. Frequently these lesions are abscesses found in the lungs or lymph nodes. The abscesses often contain a gritty, white-yellow material. Suspect lesions are confirmed by histopathology (microscopic examination of the tissue), PCR (polymerase chain reaction) testing, and/or bacterial culture (which, due to the slow-growing nature of the organism, may take weeks or months to grow).

In live cattle, reactors are identified with the use of the caudal fold test (CFT). A small dose of tuberculin is injected into the skin of the caudal tail fold. The injection site is then palpated 72 hours later. Any amount of swelling is considered a reaction, and an animal reacting as such is then subjected to comparative testing by state/federal officials to determine if the reaction is due to infection with *M. bovis* or another strain. A low level of "false positive" reactions (1-3%) are expected with the CFT.

Transmission of tuberculosis between animals occurs when susceptible animals are in close contact with respiratory secretions or aerosols from infected animals. Close contact is necessary for transmission; the infection is not considered to spread easily between cattle separated by any distance.

There are three distinct strains of bacteria that cause tuberculosis in animals and people:

1. *Mycobacterium bovis*-- affects cattle and many other species, including people and wildlife.
2. *Mycobacterium avium* -- affects mostly poultry, but can cross-infect cattle.
3. *Mycobacterium tuberculosis* -- affects humans only. Every year, there are cases of human tuberculosis reported in South Dakota (14 cases in 2006).

Bovine tuberculosis may be considered a public health concern, since it can be transmitted to people. However, people would have to be in very close contact with infected animals in order for transmission to occur. Transmission would occur when infected animals shed the bacteria from their respiratory tract via aerosols and other secretions.

The public's exposure to tuberculosis from animals is effectively eliminated by an extremely low current prevalence of the disease in the US, and the state/federal meat inspection system that identifies lesions in slaughtered animals. Infected or suspect animals are removed from the food chain. Cooking and pasteurization will kill *M. bovis* in meat and milk.

As mentioned previously, *M. bovis* can be transmitted to wildlife, such as deer. As with people and cattle, close contact is necessary for transmission. During this past fall hunting season, Minnesota officials have identified five white-tailed deer infected with tuberculosis. All were found in close proximity to the infected cattle herds in the northwest part of the state. In Michigan, white-tailed deer are considered to be significant in the epidemiology and persistence of tuberculosis in the northern part of that state. South Dakota hunters have always been encouraged to look for suspicious lesions in harvested deer and report unusual findings to the SD Game, Fish, & Parks Department.